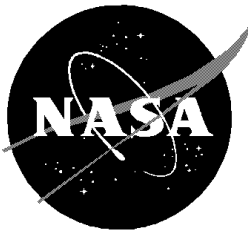


Shuttle/Payload Standard Integration Plan for Get-Away Special Payloads

Space Shuttle Program Office

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National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas

DESCRIPTION OF CHANGES TO
SHUTTLE/PAYLOAD STANDARD INTEGRATION PLAN FOR
GET-AWAY SPECIAL PAYLOADS

CHANGE NO.	DESCRIPTION/AUTHORITY	DATE	PAGES AFFECTED
--	Basic issue/B21000-SIP-GAS-001	07/10/89	All
1	Update figure 15-1/B21000-SIP-GAS-004	03/09/90	10
2	Update foreword/B21000-SIP-GAS-006	11/26/90	iii
REV A	General revision/B21000-SIP-GAS-008	11/08/91	All
1	Update table of contents and section 4.1.2/B21000-SIP-GAS-009A	06/23/92	v,1,1A
2	Update section 6.3 and figure 15-1/B21000-SIP-GAS-010	03/08/94	4,10
3	Update appendix C and add new section 4.2.3.1/B21000-SIP-GAS-011	10/25/94	1A,C-1
4	Update table of contents, section 13.0 and delete figure 13-1/B21000-SIP-GAS-012	07/11/95	v,6,7,8,9
REV B	General revision/B21000-SIP-GAS-0014	03/06/01	All

Note: Dates reflect latest signature date of CR's received by PILS.

SHUTTLE/PAYLOAD STANDARD INTEGRATION PLAN FOR
GET-AWAY SPECIAL PAYLOADS

(DATE)

PREPARED BY

PAYLOAD INTEGRATION MANAGER

APPROVED:

Date
MANAGER, SPACE SHUTTLE PROGRAM

Date
NASA GSFC GET-AWAY SPECIAL
PROJECT MANAGER

FOREWORD

This Standard Integration Plan (SIP) is intended for preparation of the primary agreement for management and technical activities required for integrated flight and ground operations of a Get-Away Special (GAS) with the Space Shuttle Program (SSP). Use of the standard format will provide a consistent definition of the required integration agreements for the payload organization and SSP implementation.

Signed by Leonard S. Nicholson,
dated 03/09/90

Deputy Director, National Space
Transportation System
Program

PREFACE

This Payload Integration Plan (PIP) represents the agreement between the National Aeronautics and Space Administration (NASA) Goddard Space Flight Center (GSFC) representing the Get Away Special (GAS) Carrier including the GAS bridge system and payloads and the Space Shuttle Program (SSP) regarding the responsibilities and tasks which directly relate to integration of the GAS carrier and payloads into the Space Shuttle and includes definition of carrier tasks which the SSP considers Customer-Funded Services (CFCs).

Signature of this document constitutes agreement on the scope of work to be performed, including CFS, but it does not commit the GSFC to the reimbursement price and schedule of payload or the SSP to the funding or implementation of CFS. However, upon completion of negotiation and signature of this PIP and any subsequent changes by the SSP and GSFC, the carrier CFS which will be identified in the payload-unique PIP will be implemented when identified funds are provided.

[Any instructional information contained in this Standard Integration Plan (SIP) is enclosed in []. All instructional information will be removed for the flight-specific PIP's.]

Issues which are yet To Be Resolved will be designated "TBR" in this PIP with the specific details of this issue(s) documented in appendix A. Information not at issue but which is yet To Be Determined is designated "TBD" and documented in appendix B.

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1.0 INTRODUCTION

All sections of Get-Away Special Carrier Payload Integration Plan, NSTS 44000, are applicable to this payload-unique Payload Integration Plan (PIP) with the exceptions as identified in the following sections.

2.0 MANAGEMENT RESPONSIBILITIES

See NSTS 44000.

3.0 PAYLOAD DESCRIPTION AND MISSION OVERVIEW

3.1 Payload Description

The Get-Away Special (GAS) payload consists of [briefly describe the payload, as follows: experiment name, sponsor, and experiment description].

Figure 3-1 payload configuration - [Provide payload configuration inside the Get-Away Special (GAS) canister.]

4.0 MISSION OPERATIONS

4.1.2 Control Parameters.-

- a. [Define canister volume.]
- b. [Define payload control weight.]

The customer shall provide configuration drawings and sequenced mass properties of the payload as part of Payload Data Package, Annex 1.

The customer shall exclude from the payload mass property data all SSP integration hardware and Orbiter Mission Kits noted in section 7.0 except where the hardware is incorporated into the payload.

The customer shall perform a weight and center of gravity (c.g.) measurement of the payload prior to delivery to the KSC integration facility. A payload Weight Log shall be maintained and verified by the customers Quality Assurance organization subsequent to the weight measurement. The Weight Log shall note

all elements/assemblies added or removed through final configuration. (Exceptions to these requirements will be negotiated with the SSP or delineated within the annex.)

Required updates of the annex data shall be made as described in the annex and shall be submitted according to the schedule in section 15.0.

4.2.3 On-orbit.- The payload crew activity requirements table is a listing of each payload task that affects Space Shuttle operations and the time or conditions of occurrence, including contamination avoidance. The payload crew activity information should be documented in table 4-1, as applicable. [Provide inputs to the following table.] The following describes the columns of table 4-1:

- a. Flight phase/event or phase elapsed time - [Name the required flight phase, such as on-orbit. If the payload activity is constrained to a Space Shuttle event, use Phase Elapsed Time (PET) (e.g., Orbital Maneuvering System (OMS) 2 plus 10 minutes). Do not use Mission Elapsed Time (MET)].
- b. Payload activity title - [Identify the name of the payload element or instrument and the event, operation, or activities to be scheduled.]
- c. Command source - [Identify the source of the command to start or stop these payload events, such as crew.]
- d. Activity duration - [Identify the anticipated duration of the scheduled event. This is the response time for equipment operation and should not include any crew time which may be involved. These times should be expressed in hour(s):minute(s).]
- e. Crew activity requirements - [State the specific action required.]
- f. Comments/desires - [Describe the initial conditions or desires that must be satisfied for the event to be accomplished. For example, a particular onboard display must be called up before a payload test can be conducted. State desires such as crew data logging, crew voice information to the Mission Control Center (MCC), etc.]

4.2.3.1 FES and Water Dump Operations: [Specify operational constraints.]

Table 4-1.- PAYLOAD CREW ACTIVITY REQUIREMENTS

Flt phase/ event or PET (HR:MN)	Payload activity title	Command source	Activity duration HR:MN	Crew activity requirements	Comments/ desires
After GO for ORBIT OPS	Unstow GAS encoder	Crew	00:15	a. Remove from AFD locker b. Plug encoder cable connector into GAS connector on the stand- ard switch panel (L12U)	
ON-ORBIT	TBS				
ON-ORBIT	TBS				
ON-ORBIT	TBS				
After last GAS relay operation	Stow GAS encoder	Crew	00:15	a. Disconnect encoder cable from the standard switch panel b. Stow encoder and cable in AFD locker	

(Note: The following acronyms were used in the table above:

AFD Aft Flight Deck
 GAS Get Away Special
 OPS Operations
 PET Phase Elapsed Time
 HR:MN Hour(s) and Minute(s)
 TBS To Be Supplied)

The GAS payload relay assignments and associated functions are given in table 4-2. [List relay assignments and their functions in the following table.]

Table 4-2.- GAS RELAY ASSIGNMENTS FOR STS-XXX

Relay assignment*	Function description (hot state/latent state)
XX (example, 00)	TBD (e.g., power ON/power OFF)
XX (example, 01)	TBD (e.g., experiment 1 ON/ experiment 1 OFF)
XX (example, 02)	TBD (e.g., experiment 2 ON/ experiment 2 OFF)

*Up to three relay assignments numbered sequentially (using 00-98) are assigned to each standard GAS payload once it is manifested on a flight.

5.0 GET-AWAY SPECIAL-TO-SPACE SHUTTLE INTERFACES

See NSTS 44000.

6.0 ENVIRONMENTAL ANALYSES AND INTERFACES

See NSTS 44000.

7.0 INTEGRATION HARDWARE

See NSTS 44000.

8.0 FLIGHT OPERATIONS

See NSTS 44000.

9.0 LAUNCH AND LANDING SITE OVERVIEW

See NSTS 44000.

10.0 SAFETY

See NSTS 44000.

11.0 INTERFACE VERIFICATION AND TESTING

See NSTS 44000.

12.0 POSTFLIGHT DATA REQUIREMENTS

The SSP is responsible for Space Shuttle system monitoring and anomaly resolution. In the event of a Space Shuttle anomaly which would influence the execution of payload objectives, the SSP will supply the Space Shuttle data as available to the customer for evaluation.

In the event of a payload anomaly, Space Shuttle data may be required for evaluation of the payload problem.

The SSP will provide the approximate time (plus or minus 1 minute) of critical GAS Control Decoder (GCD) relay operations during the mission as specified in the payload PIP.

Postflight data listed below will be provided [Mark as appropriate].

	Reqd	N/R	Remarks
a. Closed Circuit Television (CCTV)			
b. Photography			
c. Calibrated Ancillary System (CAS)			

Note: Detailed listing of CCTV and photographic requirements will be defined in the column labeled "Remarks" (i.e., number of copies of photographic prints, transparencies, etc.).

13.0 SUMMARY OF CUSTOMER-FUNDED SERVICES

This section of the PIP identifies and sets forth all services to be performed by the SSP for the customer that are currently identified as Customer-Funded Services (CFSs).

A summary of CFS services identified herein to be provided and priced to the customer for payload integration and operations follows:

Prior to initiation of individual CFS, the performing SSP organization and the customer will jointly scope tasks and the performing NASA organization will establish the estimate of governmental costs and provide it to the customer. The SSP will not initiate CFS until customer approval of a PIP Change Request (CR) and funding is received.

14.0 PAYLOAD INTEGRATION PLAN ANNEXES

See NSTS 44000.

15.0 SCHEDULE

The attached schedule, figure 15-1, provides a summary of various technical areas requiring data exchange and/or products in support of the Space Shuttle/payload integration activities.

The data indicated in figure 15-1 under major mission milestones are included for information only and are controlled by the SSP or customer organization. Other dates are directly related to the launch date specified in the current SSP-manifest; schedules will be adjusted to correspond to the current NASA-approved flight date. Necessary changes to activities caused by a change of flight date will be coordinated with the customer through the PIP change process.

16.0 APPLICABLE DOCUMENTS

The following document is applicable to the extent stated herein:

- a. NSTS 44000, Get-Away Special Carrier Payload Integration Plan, current issue*

*Current issue includes all future changes and revisions.

APPENDIX A

TO-BE-RESOLVED ITEMS

TBR No. 1 Subject: (reference section XX)

[Text of issue explaining SSP and customer positions and any course of action identified to resolve.]

TBR No. 2

TBR No. 3

APPENDIX B

TO-BE-DETERMINED ITEMS

TBD No. 1 Subject: (reference section xx)

TBD No. 2 Subject: (reference section xx)

TBD No. 3 Subject: (reference section xx)

APPENDIX C

ACRONYMS AND ABBREVIATIONS

AFD	Aft Flight Deck
B.L.S.	Bureau of Labor Statistics
CAS	Calibrated Ancillary System
CCTV	Closed Circuit Television
CFS	Customer-Funded Service
CU. FT.	Cubic Feet
FDMDA	Full Diameter Motorized Door Assembly
FES	Flash Evaporator System
GAS	Get Away Special
GCD	GAS Control Decoder
HR:MN	Hours and Minutes
L&L	Launch and Landing Facility
MCC	Mission Control Center
MDA	Motorized Door Assembly
MET	Mission Elapsed Time
N/C	No Charge
N/R	Not Required
NASA	National Aeronautics and Space Administration
OMS	Orbital Maneuvering System
OPS	Operations
PATH	Postflight Attitude Trajectory History
PET	Phase Elapsed Time
PIP	Payload Integration Plan
PPF	Payload Processing Facility
SIP	Standard Integration Plan
SSP	Space Shuttle Program
TBD	To Be Determined
TBR	To Be Resolved
TBS	To Be Supplied